## REMARKS

Claims 1, 12 and 19 have been amended. Claims 1, 4-12 and 16-19 remain for further consideration. No new matter has been added.

The objections and rejections shall be taken up in the order presented in the Official Action (hereinafter "Action").

**4.** Claims 1, 12, 16 and 19 currently stand rejected for allegedly being obvious in view of U.S. Patent No. 6,294,401 to Jacobson et al. (hereinafter "Jacobson").

**CLAIM 1**

As amended, claim 1 recites an integrated gas sensor that includes:

> "a gas-sensitive semiconductor film in contact with at least one contact electrode, a field electrode being disposed under the gas-sensitive semiconductor film and disposed above and electrically in contact with a **semiconductive** substrate for applying an electric field that controls the electroadsorptive effect of the gas-sensitive semiconductor film, and an insulator layer disposed in between the field electrode and the gas-sensitive semiconductor film, where the insulator layer has a thickness that is less than or equal to approximately the Debye length $L_D$ of the gas-sensitive semiconductor film and corresponding to the insulator layer, where the Debye length $L_D$ is given by:
>
> $$L_D = \sqrt{\frac{\varepsilon\varepsilon_0 kT}{q^2 N}}$$
>
> where T is the temperature, ε is the relative permittivity of the material of the gas-sensitive semiconductor film, $\varepsilon_0$ is the absolute permittivity, k is the Boltzmann constant, N is the charge-carrier concentration and q is the elementary charge." (Emphasis added).

The Action contends that such an integrated gas sensor is obvious in view of Jacobson. Specifically, the Action contends that the recited "semiconductive substrate" reads on the substrate 110 disclosed in Jacobson. (Action, pg 3). The Action further asserts Official Notice that a person of ordinary skill in the art at the time of the invention would have known to alter

the thickness of the insulator layer to increase the sensitivity controllability of the field electrode. (Action, pg 3). Applicants respectfully disagree and traverse the aforesaid Official Notice.

Significantly, the integrated gas sensor of claim 1 recites *"a gas-sensitive semiconductor film in contact with at least one contact electrode."* (emphasis added). In contrast, the transistor illustrated in FIG. 1 of Jacobson fails to disclose any layer that operates as a gas sensitive semiconductor film. Notably, the layer 125 is a semiconductor layer positioned between the source and the drain, and the specification of Jacobson clearly states that the layer 125 of the semiconductor layer of CdSe, CdS, CdTe or Si. However, none of these materials is capable of operating as a gas sensitive semiconductor film as is recited in claim 1 of the present invention.

In addition, the claimed invention requires a semiconductive substrate. A fair and proper reading of Jacobson indicates that the substrate is plastic. (See, for example, col. 7, lines 41-42; lines 52-53). In addition, there is no need for the substrate 110 to be semiconductive since the drain and sources of the thin film transistor are located above the insulator and separated by semiconductor material 125. The modus operanda of the invention described in Jacobson is to deposit materials onto a non-semiconductive substrate by deposition techniques such as printing, for example ink jet printing. Jacobson never discloses that the substrate 110 is semiconductive.

Furthermore, Jacobson neither discloses not suggests that claimed feature of *"a field electrode being disposed under the gas-sensitive semiconductor film and disposed above and electrically in contact with a semiconductive substrate to apply an electric field that controls the electroadsorptive effect of the gas-sensitive semiconductor film"*. (cl. 1, emphasis added). Jacobson neither discloses nor suggests this control feature.

It is respectfully submitted that claim 1 is patentable over Jacobson.

**CLAIM 12**

Claim 12 recites a gas sensor that includes a gas-sensitive semiconductor film. As set forth above with respect to claim 1, Jacobson neither discloses nor suggests such a gas-sensitive semiconductor film. In addition, Jacobson also fails to disclose a ***semiconductive*** substrate that is positioned such that at least one field electrode disposed between the insulator layer and the semiconductive substrate. Again, Jacobson fails to disclose either a semiconductive substrate or a gas-sensitive semiconductor film.

In addition, claim 12 has been amended to include the feature of *"at least one field electrode disposed between the insulator layer and the semiconductive substrate that applies an electric field to control the electroadsorptive effect of the gas-sensitive semiconductor film;"* (cl. 12, emphasis added). Jacobson neither discloses nor suggests this control feature.

It is respectfully submitted that claim 1 is patentable over Jacobson.

**CLAIM 16**

Applicants respectfully submit that this rejection is moot since claim 12 is patentable for at least the reasons as set forth above.

**CLAIM 19**

Claim 19 recites a semiconductor gas sensor that includes a gas-sensitive layer. The semiconductor gas sensor of claim 19 also includes a semiconductor substrate that is positioned such that at least one failed electrode is deposited onto the semiconductor substrate and adapted to generate an electric field. Notably, Jacobson again fails to disclose such a claimed invention

since the substrate 110 of Jacobson is not semiconductive and the layer 125 is not a gas-sensitive layer.

In addition, as amended claim 19 includes the feature of *"a gas-sensitive layer whose electroadsorptive property is controlled by the electric field"*. (cl. 19, emphasis added) Jacobson neither discloses nor suggests this control feature.

It is respectfully submitted that claim 19 is patentable over Jacobson.

**5.** Claims 4-8, 10, 11, 17 and 18 currently stand rejected for allegedly being obvious in view of Jacobson and *Electronically Controlled Metal Oxide Gas Sensors Designed with PROSA-CHEM* by Scheinert et al. (hereinafter "Scheinert").

Applicants respectfully submit that these rejections are moot since claims 1 and 12 are patentable for at least the reasons as set forth above.

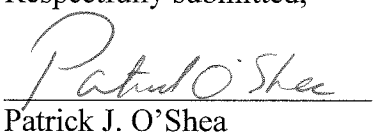
**6.** Claim 9 currently stands rejected for allegedly being obvious in view of Jacobson and U.S. Patent No. 5,140,393 to Hijikihigawa et al. (hereinafter "Hijikihigawa").

Applicants respectfully submit that this rejection is moot since claim 1 is patentable for at least the reasons as set forth above.

For all the foregoing reasons, reconsideration and allowance of claims 1, 4-12 and 16-19 is respectfully requested.

If a telephone interview could assist in the prosecution of this application, please call the undersigned attorney.

Respectfully submitted,



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